

Ron Press, New tools for Marxists, 1994

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New tools for Marxists

By Ron E. Press, 3 December 1994

Editor's note: This manuscript, reprinted here with permission, was received December 3, 1994. It was first published in Forum for Marxism, Science, and Philosophy (c/o Mike Taylor 92 Bowyer Drive Slough SL1 5EQ United Kingdom). I am placing the document here because it applies its conceptual tools to the situation in South Africa.

Political Science

The intertwining of science and society has been a subject of study of many great minds. (1) Marxism was however the first generalized attempt in the light of the scientific revolution of the 18th century, to look at the whole of human experiences as a unified system of thinking, without the invocation of an all knowing extra terrestrial being. Within its parameters were placed the physical sciences, mathematics, the social sciences, economics, politics, etc. and the acceptance that the result would always be imperfect and incomplete. (2) Lenin in Materialism and Emperio-criticism laid the foundation of this integration of science and politics. Science has undergone a revolution since that time but few Marxists have tried to re-posit Lenin's great work into the modern era. I believe modern science has a contribution to make to our understanding of present day socioeconomic forces.

Unfortunately as with all previous summations of human experience, the sum was codified and turned into a rigid dogma. Marxism specifically contained within itself

its incompleteness and changeability. But in vain, the mighty while claiming to be practitioners of Marxism patently failed to acknowledge their inability to accept change. One reason was that the sciences which were and are the powerhouse of rational thinking, had not yet developed the tools to deal with the problems of uncertainty, complexity and chaos.

Mathematics, physics, chemistry, biology, economics, were still rigorously tied to the concepts of the study of carefully separated and isolated systems. If there was a problem the first thing to do was to study it in isolation. It was further regarded as a major success if the problem could be described in terms of numbers and mathematical formulas. While agreeing that the reintegration of the segment into the whole was essential it was generally considered to be too difficult or complex. For example Chinese medicine which specifically considers the whole person, was and still is ignored or down graded (added to that it is practised by foreigners).

Because there were no scientific tools with which to grasp complexity socialists and humanists did the best they could. If there was no exceptional leader or Guru they set up a committee. If one was in power one had a much more powerful central committee and because that was too large and complex there was a smaller politburo or cabinet. I submit that we are still on the same treadmill and it is no longer good enough. We need to grasp the new developments in the study of complexity, chaos theory, and non-linear mathematics. We must not set up more and bigger committees. Central government structures must be subservient to and act at the behest of the organizations of the people and no longer try to know it all and control.

It is time to stand back and with the latest tools developed by humankind to take a new look at forms of organisation.

New Tools

Information and Computation

Computations

Complex systems involve the storage and movement of vast quantities of information. Computers in the last decade have advanced so that they can store and access information with speed and sophistication. This ability is merely an extension of the library at Alexandria. Computers do this in essence by the extremely rapid manipulation of numbers. Thus the trajectory of a space vehicle under the influence of multi-body gravitational forces intractable with standard

mathematics becomes quite amenable to numerical methods especially with the help of computers.

Complex questions such as predicting the weather have been possible in theory for decades. However the calculations take so long by ordinary numerical methods that the answers were but predictions of history past. With computers it is now possible to perform these tasks timeous and with increasing, but incomplete, accuracy. The resultant predictions depend critically on the initial parameters, the so called butterfly effect. Meteorologists are on a never ending merry-go-round in their search for more accurate predictions. (3, 4)

Economists are in an even more difficult position. The old Soviet Union organised industrial production by trying to regulate supply and demand with the use of statistics. As the economy grew so the data grew and computers were brought in to assist. (5) History has shown this command economy was too complex to be subject to centralised control. This of course is likewise the case in the so called market economies where computer models have proved to have a very limited predictive success. (6)

Are economies, like the weather, actually incomputable? There is a considerable part of the economy which is unknown to the statisticians, the so called “black” economy, thus the initial parameters are in their nature inaccurate. Further economies are subject to the ability of people to learn as well as to their whims and emotions. The GATT talks are yet another illustration of unrestrained futility. There is no chance that the worlds economy or even the trade side of it can be understood or directed by any committee let alone one set up in such an unrepresentative manner.

Politics has likewise proved to be like the weather: not only unpredictable but small insignificant actions often cause major storms and changes. There are numerous examples which can be presented but I will confine myself mostly to some from South Africa of which I have personal experience. What was the spark that set off the tidal wave of strikes in the early 1970's? Who heard the initial whisper that grew into the shout that brought the children out onto the streets in 1976? (7) The government, the African National Congress and the Communist Party had led the general public to believe that the “Communists” and “Agitators” were the instigators of the revolution. We thought it meant that the political movement was the spark, the initiator of the actions and storms of the people against apartheid. History should, I submit, teach us that very often it is the action of the butterfly wing that is the initiator of the political storm. Politicians, if anything, can supply the leadership, in theory and practice, that makes that storm a force for progress and

not for destruction. Any shop-steward will tell you that although organised workers may strike for higher wages and better conditions when asked to do so by the union, many bitter and successful strikes have been sparked by the flimsiest of reasons. The release of Nelson Mandela is another example of an act which has had far reaching consequences many of which, such as the terrible increase in politically motivated violence, were quite unforeseen.

The real qualitative difference computers have made is the extra dimension given to the mathematician over and above their ability to manipulate data. The computer has given us a tool with which to investigate complexity. These are systems that are intractable without the use of computers. There are so many multiple choices that it would appear that there is no possibility of a non chaotic outcome. I refer to games theory, emergence and the insights these give into evolution, genetics, and similar problems. (8)

Marxists must recognise that change is not controllable or directable but emerges from the complexity of society. It is up to the politicians, the Marxists, to interpret and understand these changes. We are not the directors but the detectors of change.

Information theory

Modern information theory has given rise to ideas such as information bandwidth and entropy, i.e. how much information can be carried by a transmission line, how reliable or incorruptible the system is, how quickly is the information transmitted. In socio-political terms materials and people must be included in the discussion of such exchanges. (9)

These advances in theory and even more importantly in practice are vital for the understanding of present day politics and socio-economics. Ideas like “can a revolution succeed in one country” were more viable in 1917 than today. “Not in my back yard” was a reasonable request a few years ago but not now when we live in each others back yards. The global village or global economy are directly related to the modern facility for the transmission of information and materials. In the mathematics of politics the separation of variables becomes more and more non-viable, the poor cannot be considered separate from the rich. Solutions to problems based on a narrow set of factors prove to be relatively valueless. The present history of South Africa is particularly interesting because it is a country where the three worlds coexist in the same geographical area, and mimics all the worlds’ major problems. (10)

Censorship, restricted access to the media, banning of political parties, trade restrictions, the hoarding of grain stocks, etc. are examples of a narrowing of the information or exchange bandwidth. The use of disinformation organisations and agencies, bans on immigration and unfair trade practices (GATT), are examples on the deliberate corruption of transmission. There is the added danger of a secret network being developed which distorts and eventually even subverts the main system. (Computer viruses, Secret services etc.) (11)

The release of Nelson Mandela together with the un-banning of the numerous organisations of the people dramatically increased the information bandwidth of politics in South Africa with dramatic results.

Chaos Theory and the structure of Complexity

Many systems have been found to be organised into fundamentally similar structures. The universe consists of relatively dense centres of matter, galaxies, which exchange energy/matter in the form of radiation, between them. Stars, of which galaxies are composed, exchange radiation and matter between them. The same pattern is seen with for example living matter. Genes hold the species coding which by the exchange of information carried by messenger proteins allows the reproduction of new genes. Cells are enclosed systems which are alive and stable and constantly exchange materials with their environment. The animal's organs consist of networks of cells just as the animal itself is a set of interacting organs.

Groups of people form clubs or associations. Interacting groups of people make up communities. Communities form countries. The interaction between them is in the form of the exchange of information and goods.

A computer program similarly consists of a set of numbers which constitute the instruction set (i.e. the node) and the electronic system which carries the information in the form of numbers from node to node. But more of this later.

The motif in all these cases can be expressed as a structure of nodes and exchanges. The nodes are stable though not static. The channels of exchange connect the nodes in complex sometimes ever changing patterns.

Additions to the structural picture

Arising out of the theories of the structure and origins of the universe, is the suggestion that a very large percentage of the mass of the universe is as yet unaccounted for. (12)

The weakest force, gravity, is in the end one of the most influential and important of all.

The biochemical processes which define and constitute the life of the human body make up but a small proportion of the mass of the body which is mainly water.

In fact large percentages of any system at the first cursory glance take a back seat in its operation. But on closer examination are none the less very important.

Like wise the “Silent Majority” in the end have a major influence on the operations of society. The CPSU disregarded their own silent majority with disastrous consequences.

Nodal distributions

Nodes are seldom distributed uniformly and this indicates that certain groups of nodes carry extra weight. In galaxies there is usually a definable centre around which the stars revolve. Similarly our sun is the most important body in the solar system. Neurons are distributed throughout the body but those concentrated in the brain pay a major part in the operation of the organism. The CPU is the heart of the personal computer although there is much electronics besides. So in society there are many organisations but central government structures are a major player.

Sequential changes

Quite complex systems such as the shape of a fern or the flocking of birds, have been shown to derive from very simple initial parameters. This has been shown to be very similar to the reasons for the popularity of a pop song, or in some cases the collapse of a political party. It is consistent with the effect experienced when slight deviations from generally accepted norms go uncorrected, for example the “deviations” of a Mao or a Stalin. The progression of Gatsha Buthelezi from being a supporter of the ANC to being one of its main opponents is a case in point. (13)

There is however another form of emergence which arises spontaneously from an initial system which has a seemingly infinite set of possible outcomes. The primordial soup from which an infinite number of possible chemical compounds and biological systems could arise gave birth to the limited set of organisms alive on our planet today.

If we regard successive changes in terms of some sort of progress then perhaps we believe in a benevolent God. Or perhaps we believe in evolution where successive changes adapt a species to better cope with its environment.

Perhaps the past is handed on to the future with our genes.

The concept of successive change or emergence is tied up with entropy, the arrow of time, and the self organisation of complex systems. (14, 15,16)

Stasis Chaos and self organisation

Picture a dam across the Vaal River in South Africa. The water is in constant motion, water comes in and water goes out but the system is clearly recognizable as a dam.

A small leak develops in the dam wall. This will lead to catastrophic failure and devastation. The system will later settle down to a new stable equilibrium.

This picture is extremely common in the workings of nature. Ice is a stable structure with each water molecule in a “fixed” space. Stasis or order dominates. Melt the ice and there is fluid water. It cannot stand on its own feet, so to say, its molecules are in chaotic disorder and all stability is gone. Very interesting structures arise however when a liquid/solid is held just at the melting point.

Consider Yugoslavia. All was stability and order. There were clearly undercurrents and movements of the economy and the socio- political system, but it was recognizably Yugoslavia. How different the picture is now. Chaos high arbiter sits making chaos worse confounded. There are clearly Nodes, the various Serbian, Croat and Moslem armed gangs, communities, presidents etc. There are also exchanges but these are on a very narrow information bandwidth consisting mainly of mortar bombs and bullets, this has severely restricted the possibilities of new structures arising to solve the crisis.

The socio-economic system of the world was in relative stable order prior to the first world war. The war created chaos and disorder especially in the then Empire of the Tzar. Out of this chaos, out of the interface between the stability of Capitalism and the Chaos of famine and war came the first socialist system. In particular the Soviet form of organisation as recognised by Lenin came into being. The ‘Soviet’ system was not invented or created by the communists but emerged from the system itself at a time when the system itself bordered on chaos.

The interface between stasis and chaos is the birth place of the new.

Crisis is the birth place of opportunity. Stability and order is the precursor of chaos.

Computer Simulations

There have been a number of computer simulations of complex systems. They have demonstrated a number of phenomena which mirror various aspects of political life. The instruction set (which is set up to be self modifying) can be considered to be the node and the running of the program is the exchanges being set in motion.

A number of remarkable things were observed in various simulations for example. In one example numbers were sorted by a short instruction set. The original instruction set reproduced itself. A new instruction set evolved which could sort the numbers much more efficiently. This grew rapidly in number. A completely different instruction set then appeared. This grew at the expense of the number sorting set, it was in fact a parasite. The number of the sorting instruction set decreased but the combination of the parasite set and the sorting set proved to be even more efficient at sorting numbers.

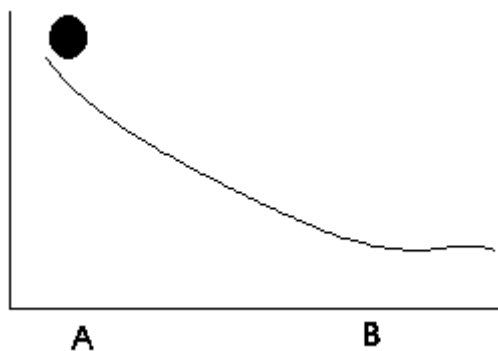
In another simulation the instruction set grew rapidly in number. Then it suddenly collapsed to be replaced with a chaotic period of apparently unproductive activity. This was replaced by a sudden blossoming of an even more vigorous species. In looking back into the computer's activity during this time it was found that the seeds of the vigorous species could be found within the developments during the period of chaos.

These and other simulations showed patterns remarkably similar to those found in evolution, economic activity, and the organisation of society. They are recognisably "Marxist" concepts.

Theory and struggle

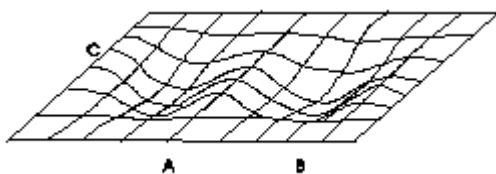
For example the standard Marxist idea that society passes in a linear manner from primitive communism via class struggle to the ultimate victory when the working class replaces capitalism with a classless society is an unattainable myth. Especially when a classless society was taken to mean the establishment of order and stability, in fact stasis. The theories outlined above indicate that stasis means the inevitable sudden crossover into chaos and collapse. Progress (more satisfactorily the direction of times arrow) is much more like the weather, summer follows winter but there are summery days in winter and wintry days in summer and sometimes the rains fail to come at all.

Strange attractor



Consider a simple two dimensional system (i) where point (a) represents a mode of production based on a free for all with the devil take the hindmost and (b) represents a mode of production where the welfare of all its citizens is its major consideration. In classical terms (a) is represented by the private ownership of the means of production and (b) by their social ownership. The ball will roll to point (a) and

then on to point (b). This is an extreme simplification of classical Marxist thinking. It is consistent with the simplistic terminology of 'capitalism' and 'socialism'. (I will use the term socialist in its broadest definition, 'The general advancement of the whole population - not individual enrichment'.)



Consider the more complex three dimensional system (ii). A ball released at point (c) will roll down to the depression (a) but may well not stay there but perform a complex set of manoeuvres before it ends up circling point (b). This sort of

picture is more in line with the perspectives of modern mathematics and strange attractors. As an aside, the pattern of path of the attractor is repetitive but never exactly so. This encapsulates the phrase that 'history repeats itself'.

The life of society can perhaps be considered to be a multi-dimensional system where (a) represents "Capitalism" and (b) represents "Socialism." The dimensions could be perhaps, housing, health, jobs, leisure, and so on. Then society could be expected to move from (a) to (b). The precise definition of either points would be impossible, and society would never be found at either point but would pass from the vicinity of (a) to the vicinity of (b). The terms Capitalism and Socialism become more meaningful and much broader. They do however represent two different types of society, they are distinctly different species. Lenin in State and Revolution continued the work of Engels and Marx in outlining the parameters which form the basis for the definition of systems indicated by points (a) and (b). It is interesting that they did not define the form or structure which socialism will have. Lenin recognised these new structure when they emerged. He initiated the slogan "all power to the soviets".

There can be little quarrel with the pattern of society passing from primitive communism through slavery.... to capitalism and thence to some better system.

Times' (17) arrow is inherent in our understanding of the universe. The idea of the motion of such a complex system such as society being described in terms of strange attractors rather than simple mechanical motion is inviting. As also is the description of society in terms of a multi- dimensional space where an exact definition is accepted to be impossible and where any definition contains multiple facets, private property, the market, co-operatives,and so on. Modern capitalism itself contains aspects of slavery, socialism, co-operation and antagonisms etc.

This is the pattern indicated by history and exemplified by the computer models.

But humankind is not a mindless computer. We can think and by understanding the laws of nature can help avoid disasters and create a better life for all.

The organisational form of society must be such that it does not become a straightjacket. We must accept a form of organisation which operates at the edge of order and chaos. Only in this way will we avoid the violent destructive swings of, peace and calm (in essence stagnation) on the one hand, and armed violent chaos on the other.

Some Suggestions

Dictatorships take it upon themselves to organise society for the good of the dictatorship. They impose stasis. "Socialism" under the guidance of the CPSU imposed stasis for the good of the people. In the beginnings of building socialism in the Soviet Union the Party acted as the exchange system between the nodes (for example the Soviets the trade unions etc.). It however became not an instrument for exchanges but for bureaucratic control. Without free exchange the system relapsed into stasis. With modern methods of communication and transport a future governmental structure must encourage, not stifle, free exchanges between the nodes of the new society. The central government whilst remaining the major concentration of nodes must still be but part of the system.

The greater the bandwidth and the greater the speed of communication between nodes of society the greater the possibilities of necessary changes being accommodated and stasis being avoided. The human brain is the bodies most sensitive organ designed to react to and counter danger and instigate action when appropriate. It is however in the nature of the total organisation that the brain cannot control or dictate to the various neural systems in the rest of the body. Mind is very limited in its power over matter.

Modern capitalism controls the organisational forms of society so that capital will profit but it has learnt to allow a certain degree of anarchy, which in essence acts as a stabiliser.

Socialism by definition is there for the benefit of the people. It is a species different from capitalism. What benefits the people must however be determined by the people and not subsumed by the leadership of political parties even if they are elected. The Congress of the People in South Africa in 1955 was one example of how to do this. If point (a) above is the Apartheid system then the Freedom Charter (18) was an attempt to define for South Africa the parameters of point (b).

Socialism must make this summation of the desires of the people a natural result of the form of organisation of the state.

Since the demise of "Socialism" in the Soviet Union the various Communist, Green, Socialist,... parties and other organisations such as Green Peace, CND,are looking for and in serious need of a definition, in the broadest terms of the point (b). The Sao Paulo Forum is a major step in this redefinition. This and other such forums are essential for the world in general since with the tremendous bandwidth of present day communications almost all problems immediately become global problems.

The organisation of socialism must therefore be synonymous with the organisation of the people. A socialist government must encourage and assist any organisation which is based on the principle of sharing and mutual assistance. A proliferation of organizations based on these ideals can only strengthen socialism and democracy.

The organizations of society, trade unions, Co-ops, factories, corporations, political parties, banks....., are the nodes of society, the exchanges are of information, goods, personnel, money, culture..... The State must be the orchestrator the organiser of organizations.

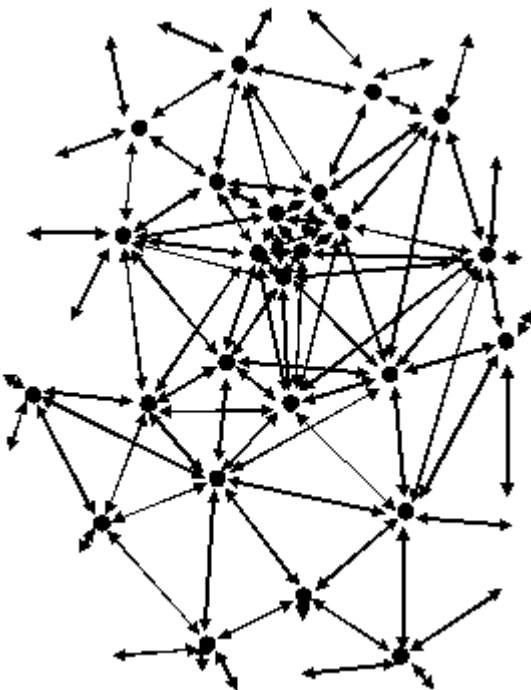
In South Africa the UDF was such an organisation. The lessons of that era must not be lost but revived and implemented once again. The Civics, the Non Racial Sports Congress, the Trade unions, the various National Forums, ... are correctly being helped and encouraged. The flourishing of these organisational forms was fostered by the broadening of the information bandwidth when the organisations of the people were un-banned in South Africa. Much more must be done especially to free the media and decrease the violence. Both act to prevent and hinder exchanges.

The future state to be democratic must include in its ambit not only organizations which are friendly to socialism, but any organisation which represents a significant

sector of society. The CODESA system is clearly a pattern to be followed. It tries to embrace all opinions which can be persuaded by “sufficient consensus” to remain in the process of bringing peace and democracy to South Africa. I submit however that the new South Africa that we hope will result from the process must not end up with a government which then ditches the process by which it has been able to come to power. The suggestion of a Government of National Unity extends the lifetime of the “sufficient consensus” process. I submit it must be enlarged and extended to embrace all organizations.

I see no impossibility for education to be run by a “CODESA” of those in the education sector. Or for health to be structured in a similar manner. Various Forums, economic, housing, education, are already in place or being constituted. The demand is already there. The regime barely goes so far as to accept these structures as advisory bodies. We must constitute them as policy making bodies. They are the nodes of society the socialist/democratic state must facilitate the exchanges between them and itself. It should be constituted as a central node composed of representatives from and answerable to these nodes of society.

The Reconstruction Pact being discussed by COSATU, the ANC, SACP, SANCO etc., including those of the employers, and others, is an example of this new organisational structure evolving in South Africa. The focus of the pact could be considered to in our previous terminology the point (b), a society designed to benefit the majority.(19, 20) South Africa is at present hovering somewhere between point (a) and (b).



To some it might be construed as encouraging anarchy, or the advocacy of permanent revolution. But if there is a lesson to be drawn from the study of complexity it is that a complex system given a very “simple” goal (in our case the well being of humankind) develops its own best methods of operation and organisation. Solutions emerge from the system itself. Imposition of solutions by committees or wise men (I use the term advisedly) are incapable of any but makeshift temporary periods of stability followed by periods of violent chaos.

On the tentative steps taken by the people of South Africa nationwide a new system of organizing the state is possible. A system is being forged, capable of addressing change in a relatively ordered manner. By understanding that we must live on the edge between stability and anarchy we can perhaps make evolution of society less cruel and destructive than the evolution of species.

Time's arrow in South Africa is in practice acting as an example to others for the resolution of their conflicts. Is it also offering more profound lessons in the progress of humankind to a better more caring future.

In the Soviet Union the "Soviet" i.e. committee system was destroyed by restricting the bandwidth of communication, and making one node all powerful. Once again the chaos interface in South Africa is setting an example for a possible solution to the problem of democratic organisation of a society. One lives in hope although the pressure for "Strong Central Government" increases. The statement by Nelson Mandela at the special congress of COSATU is however encouraging. "I fully believe the ANC will never betray the cause of democracy, the cause of the workers. ...But your defence is not just the ANC, it is you, the workers yourselves. It is you who must take the defence of your rights, your aspirations in your own hands....." Behind this thinking is, I believe the structural and organisational system indicated by modern scientific research which I have attempted to outline above. (21)

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22101, Ron Press, New tools for Marxists, 1994

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